

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Hineman et al.

Serial No.: Not Yet Assigned

Filed: January 29, 2004

For: METHODS FOR IMPROVING
METAL-TO-METAL CONTACT IN A VIA,
DEVICES MADE ACCORDING TO THE
METHODS, AND SYSTEMS INCLUDING
THE SAME

Confirmation No.: Unknown

Examiner: Unknown

Group Art Unit: Unknown

Attorney Docket No.: 2269-5925US
(03-0290.00/US)

NOTICE OF EXPRESS MAILING

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INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In compliance with the duty to disclose information material to patentability pursuant to 37 C.F.R. § 1.56, it is respectfully requested that this Information Disclosure Statement be entered and the documents listed on attached Form PTO-1449 or PTO/SB/08 be considered by the Examiner and made of record. Copies of the listed documents are enclosed pursuant to 37 C.F.R. § 1.98(a).

In accordance with 37 C.F.R. § 1.97(g) and (h), filing of this Information Disclosure Statement is not to be construed as a representation that a search has been made or an admission

that the information cited herein is, or is considered to be, material to patentability as defined in 37 C.F.R. § 1.56(b). Further, no representation is made by Applicants herein that no other possible material information as defined in 37 C.F.R. § 1.56(b) exists.

U.S. Patent Documents

<u>U.S. Patent No.</u>	<u>Publication Date</u>	<u>Patentee</u>
US - 6,204,192 B1	03/20/2001	Zhao et al.
US - 6,319,842 B1	11/20/2001	Khosla et al.
US - 2001/0049181 A1	12/06/2001	Rathi et al.
US - 2002/0098685 A1	07/25/2002	Sophie et al.
US - 2002/0167089 A1	11/14/2002	Ahn et al.
US - 2003/0022509 A1	01/30/2003	Rathi et al.
US - 6,534,397 B1	03/18/2003	Okada et al.

Foreign Patent Documents

<u>Document No.</u>	<u>Publication Date</u>	<u>Patentee</u>
WO 99/60601	11/25/1999	Cohen et al.

Other Documents

EISENBRAUN et al., "Selective and Blanket Low Temperature Copper CVD for Multilevel Metallization," Materials Research Society Conference Proceedings, ULSI VII, 397 401 (1992).

KLAUS, J. W. et al., "Atomic Layer Deposition of Tungsten Nitride Films Using Sequential Surface Reaction," Journal of Electrochemical Soc., 147:3, 1175 81 (2000).

KALOYEROS et al., "Blanket and Selective Copper CVD From Cu(fod)₂ For Multilevel Metallization," Mat. Res. Soc. Symp. Proc., Vol. 181 (1990).

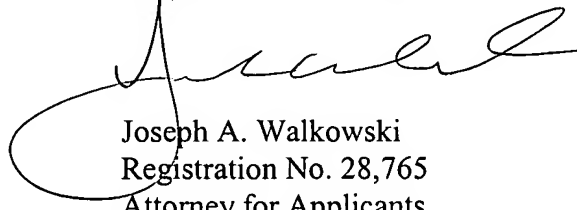
SHACHAM-DIAMAND et al., "Copper Electroless Deposition Technology for Ultra Large Scale Integration (ULSI) Metallization," Microelectronic Engineering, Vol. 33, pp. 47 48 (1997).

ZHENG et al., "Polymer Residue chemical Composition Analysis and its Effect on Via Contact Resistance in Dual Damascene Copper Interconnects Process Integration," Microelectronics Journal, Vol. 34 (2003), pp. 109-113.

Applicants offer to supply any explanation or discussion of the documents that the Examiner feels is necessary or desirable and which is requested.

This Information Disclosure Statement is filed within three (3) months of the filing date of the above-identified application, and no certification pursuant to 37 C.F.R. § 1.97(c) or a fee pursuant to 37 C.F.R. § 1.17(p) is required.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'J. Walkowski', is written over the typed name and address.

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Date: January 29, 2004

JAW/dlm:ljb

Enclosures: Form PTO-1449 or PTO/SB/08
Cited Documents

Document in ProLaw

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if Known	
				Application Number	Not Yet Assigned
				Filing Date	January 29, 2004
				First Named Inventor	Hineman et al.
				Group Art Unit	Unknown
				Examiner Name	Unknown
Sheet	1	of	2	Attorney Docket Number	2269-5925US (03-0290.00/US)

[illegible][illegible]

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet

2

of

2

Complete if Known

Application Number	Not Yet Assigned
Filing Date	January 29, 2004
First Named Inventor	Hineman et al.
Group Art Unit	Unknown
Examiner Name	Unknown
Attorney Docket Number	2269-59251US (03-0290 00/US)

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		EISENBRAUN et al., "Selective and Blanket Low Temperature Copper CVD for Multilevel Metallization," Materials Research Society Conference Proceedings, ULSI VII, 397 401 (1992).	
		KLAUS, J. W. et al., "Atomic Layer Deposition of Tungsten Nitride Films Using Sequential Surface Reaction," Journal of Electrochemical Soc., 147:3, 1175 81 (2000).	
		KALOYEROS et al., "Blanket and Selective Copper CVD From Cu(fod) ₂ For Multilevel Metallization," Mat. Res. Soc. Symp. Proc., Vol. 181 (1990).	
		SHACHAM-DIAMAND et al., "Copper Electroless Deposition Technology for Ultra Large Scale Integration (ULSI) Metallization," Microelectronic Engineering, Vol. 33, pp. 47 48 (1997).	
		ZHENG et al., "Polymer Residue chemical Composition Analysis and its Effect on Via Contact Resistance in Dual Damascene Copper Interconnects Process Integration," Microelectronics Journal, Vol. 34 (2003), pp. 109-113.	

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